DOCUMENT RESUME

ED 116 684 IR 002 929

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TITLE Library Automation in the Small College Environment.
INSTITUTION Gustavus Adolphus Coll., St. Peter, Minn.
PUB DATE Dec 75
NOTE 15p.; Paper presented at the College and University Systems Exchange National Conference (Denver, Colorado, December 3-5, 1975)

EDRS PRICE MF-$0.76 HC-$1.58 Plus Postage
DESCRIPTORS Bibliographies; *Cataloging; *College Libraries; Library Acquisition; Library Administration; *Library Automation; Library Circulation; Library Expenditures; Use Studies
IDENTIFIERS *Folke Bernadotte Memorial Library; Gustavus Adolphus College; Minnesota

ABSTRACT

The Folke Bernadotte Memorial Library contains 200,000 volumes and 900 serial subscriptions and operates with an annual budget as of 1974-75 of $235,000. It serves 2000 undergraduates in a 4 year liberal arts college. Library automation is used in the following areas: (1) bibliographic compilations; (2) cataloging of books, octavo choral performance scores, an art slide collection, and a microform collection; (3) acquisition fund accounting; and (4) compilation of statistical processing packages for surveys of use patterns and circulation statistics. The appendixes contain three examples of program printouts. (NR)

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LIBRARY AUTOMATION IN THE SMALL COLLEGE ENVIRONMENT

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The literature of library automation has focused almost exclusively on systems for large libraries. Proponents of these mega-systems for libraries have believed "that anything less than the ultimate system wouldn't be a satisfactory answer to library needs."[1] Perhaps because of the more limited funds and staffing available to libraries with collections under 250,000 volumes, the spectacular attempts at comprehensive and integrated library data processing systems have seemed only remotely related to the realm of reality experienced by small college librarians. However, with waning Federal funds and a recognition of implementation difficulties, such authorities as Hayes and Becker have been led to state "not only are less ambitious systems likely to be adequate answers to library needs, they are absolutely necessary stages in the development of the more sophisticated ones."[2] It is indeed strange that almost no literature is available on computing at a level appropriate to the size, funds, and available hardware of the 648 small college libraries[3] in the United States.

The experiences and projections of modest level automation at the Folke Bernadotte Memorial Library, Gustavus Adolphus College, form the basis for this paper. They are in the areas of bibliographic compilations, cataloging of peripheral collections, and acquisitions fund accounting. The library contains 200,000 volumes and documents and 900 current serial subscriptions with an annual budget of $235,000.00 in 1974-75. The library of the four-year liberal arts college services 2,000 undergraduate students.

COMPUTING FACILITIES

Gustavus Adolphus College is located twelve miles from Mankato State University and is able to rent computer time and services from

their computer center at a reasonable cost.

Housed in the computer center at Gustavus is a UNIVAC 9200-II computer with 16K memory. The 9200 is used both as an in-house computer for administrative functions and as a remote batch terminal accessing the UNIVAC 1106 system at Mankato State. The 1106 has a 262K word memory and provides Gustavus with access to software such as BASIC, FORTRAN, ALGOL, SNOBOL, and SPSS.

In addition to the 9200, Gustavus has six CRT terminals (UNIVAC U-100 scopes) which are also linked to the 1106. One of the terminals is located in the library and has a hard-copy printer attached.

BIBLIOGRAPHY PROGRAM

A frequent activity of reference librarians is the compilation of bibliographies. If the lists are to be successful a necessary requirement is updating to keep the bibliographies current. This updating can be a lengthy project, particularly if it requires retyping of substantial annotations. Also, it is occasionally desirable to have a larger bibliography, e.g., a list of important reference resources for an academic department, in addition to smaller bibliographic aids selected from the parent bibliography for use in a particular course within the discipline. This again requires a duplication of clerical activity. A further cause of manual replication is the desirability of having the same title listed under multiple subjects if the bibliography is subject arranged.

The programs described below were devised to enable compilation of common size bibliographies (less than 1,000 records), to reduce the need for manual repetition in preparation, and to allow for the possibility of "spinning off" sub-bibliographies for more specific

uses. This definition of common size differs by an order of magnitude from what is described in the literature as "small library files", i.e., 10,000 to 20,000 records.

The data base created by the first program listed below is not altered by the subsequent programs. Thus, it is only necessary to input the raw data once and yet to have the capacity for sorts by author, title, subject, call number, or combinations of these. This means that even for a single bibliography, for which no future use is envisioned, it can be economical in terms of clerical and professional time to use this package if more than one of the above sorts is required. The savings are most dramatic, however, if extended use with projected updating or desired sub-bibliographies are anticipated. Sub-bibliographies from a parent bibliography can be created by using a standard system editing package to write the desired records to a special file.

Some examples of current and projected use at Gustavus Adolphus College are special topical bibliographies such as a "hunger" bibliography prepared to correlate with the national Food Day, 1975, a bibliography of publications by faculty members; and an index to periodicals to which faculty personally subscribe (providing a supplement to the library periodical holdings). The generic nature of the programs, however, allow for use wherever it is desirable to sort a list of objects or concepts by their names or their attributes.

Subject bibliographies are handled by four separate programs: BIBLIO-LIB, LIBKEY, LIBSORT, and LIBPRINT.

The first, BIBLIO-LIB, is the main program that interfaces with the program user to create or to add records to a given bibliography, or to provide a printout of the bibliography. The program, written in

BASIC,[5] is designed to be used at a terminal. It requests information from the user in a manner that is simple and straightforward so that non-technical personnel, with only fifteen minutes of instruction on the terminal and the program, can use it effectively.

First, the program requests the name of the particular bibliography with which the program user wishes to work. If the user is constructing a new bibliography, six lines must be added to the programs. This is done by either the Readers' Services Librarian or the Director of Academic Computer Services, depending on the origin of the request.

Instructions as to how to input the data are provided by the program if requested.

The program user is then asked to indicate whether he/she is (1) adding records to the bibliography, (2) requesting a printout of the bibliography, or (3) making changes to record(s) in the bibliography.

If the user is adding records, for each record entry the program successively asks for:

1) the author(s);

2) the title, which may require more than one line of input;

3) the journal name, if the record represents a journal article;

4) the imprint information, i.e., city, publisher, and date, or, if it is a journal article, the volume number, pages, and date;

5) the call number, if there is one;

6) the subject category - the user may input as many subject catagories as he/she wishes; and

7) an optional abstract, not to exceed 500 characters (about 85 words).

At several intervals in this sequence the user is asked if he/she wishes

to restart the record. This allows the user to correct any errors he/she may have inadvertently made, before the record becomes part of the bibliography. This should not happen frequently, because the user is instructed to scan each input line before transmitting it to the memory.

Each record is treated as a single string of characters, each field in the string delineated by a special character (<). However, because of the limitations on BASIC, that string must be subdivided into subrecords each having a fixed length of 132 characters. Included in each of the subrecords is (1) a field to indicate the number of subrecords in a record, (2) the sequence number of the given subrecord in a record, and (3) two currently blank fields which will be used as sort keys when a printout is required.

When the user is finished, the records are written on a mass-storage file.

If the user requests a copy of the bibliography, he/she has the option of a printout sorted by

1) author,

2) title,

3) call number,

4) subject,

5) author within subject,

6) title within author, or

7) title within subject.

The printer halts under program control, requesting special forms. The program user may request up to ten copies of the bibliography for each run.

The BASIC program then calls a FORTRAN program, LIBKEY, which inserts the appropriate keys into the key fields described above, for sorting. The major key consists of twenty characters and the second key ten characters. Thus, if a title sort is requested, only the first twenty characters of the title are inserted into the sort key. The same sort keys are inserted into the sort fields of each of the sub-records of a given record, thus linking these together.

Next the sort routine, LIBSORT, is called which does a lexicographic sort on the sort keys. The sort routine sorts partial files, if necessary, and merges them.

After the bibliography is sorted, the final program, LIBPRINT, is called. It is written in FORTRAN, and prints the sorted records according to one of several formats, depending on whether the request is for a simple sort, a major and minor sort, and whether or not an abstract is given for the entry.

If the user selects the option for making changes to records in the bibliography, he/she is instructed to use a standard edit processor and is given instructions on how to call it up for use.

Finally, copies of the bibliographies are kept on tape for back-up purposes.

CATALOGING OF PERIPHERAL COLLECTIONS

Full cataloging of many collections on a college campus using the traditional rules[6] laid down for that practice would be an unreasonable activity. Significant items, e.g., octavo scores of choral music, have not been covered by the Library of Congress in its catalogs of printed cards or on MARC tapes. This means that nearly the entirety of any cataloging project would consist of "original cataloging". Further,

the end product of traditional cataloging is usually a file of individual cards which is somewhat cumbersome if multiple copies are desirable for use by faculty or students.

Using the series of four programs described above for bibliographic compilations it is possible to generate a "book catalog",[7] and thus assure increased bibliographic control of materials in collections of relatively small size. Certain bibliographic niceties are not provided by the programs.[8] However, the requisite bibliographical control is provided and access is available via the traditional avenues of author, title, and subject or intellectual content.

When the bibliographic data processing programs are employed for the purpose of cataloging, the abstract portion of each entry is available to contain information usually relegated to the "shelf list" cards, e.g., number of copies, date of acquisition, name of ordering department, price. This data is suppressible for normal printing of the "book catalog".

Examples of present and projected uses of the cataloging capacity are a catalog of the octavo choral performance scores library, an art slide collection library, and an index to serial titles available on microforms.

ACQUISITION FUND ACCOUNTING

To maintain control over material acquisition funds for a library it is necessary to have information on the status of the funds encumbered via book orders, funds actually expended on invoices for acquired materials, funds actually remaining for the fiscal year, and projected funds remaining (budget minus invoices and encumbrances). This information is required for each department or category as well as gross

summaries for the entire budget.

The program described below fulfills these criteria. The advantages of the automated system are projected[9] time savings over the current system which requires manual addition and retyping of the list on a regular basis in addition to increased accuracy.

Again, this program is written entirely in BASIC and may be used by non-technical personnel in an interactive mode.

The user has the option of getting a report only, or of updating the accounts, in which case a report is provided at the end of the run. If updating is requested, the user enters the name of the department followed by (1) the encumbrances for that department, (2) the amount paid for the books purchased by the department, and finally (3) the encumbrances that were originally entered for those books.

This information is currently available on a card file which is referenced by the user of the program. It is envisioned that eventually this information could also be included in the department files on mass storage, but there are some difficult problems with which to deal. For example, the titles of the requested books on the invoice may not correspond to the titles on the purchase orders.

When the updating is completed, the program prints a report which lists the original budget, the outstanding encumbrances and invoices paid, the remaining actual funds (the original budget minus funds already spent) and the remaining projected funds (funds not yet spent minus the outstanding encumbrances).

COMMERCIAL STATISTICAL PROCESSING PACKAGES

The statistical packages on small systems can have numerous potential uses in the small academic library. They are commercially

available and frequently obtainable on academic computers. For surveys of use patterns, circulation statistics, etc., these packages are highly useful. A recent example of use is the study of reference service at Yale University by Balay and Andrew.[10]

CONCLUSION

The attempt here has been twofold: 1) to draw attention to the need for what might be called modest or appropriate level automation of some small academic library functions and 2) to describe some functional programs devised to fit these needs in a generic way. The programs provide for simple user interaction while using a processing system which is comparable to that accessible to many college libraries. This means that the programs can be used with a minimum of training either by clerical personnel or librarians who have little or no knowledge of computing. It also means that the programs have a low implementation cost vis-à-vis the DMS systems advocated in the literature for the same audience as this paper.[11]

Increasing numbers of small academic libraries are connecting with existing large scale, on-line networks such as OCLC[12] or are using commercial data processing houses such as Information Design for production of catalog cards from Library of Congress MARC tapes. Yet there are still library functions which are appropriate for local automation in the small college environment.

REFERENCES

[1]Robert M. Hayes and Joseph Becker, Handbook of Data Processing for Libraries, 2nd ed., Melville Pub. Co., 1974, p. 64.

[2]Ibid.

[3]Four year or two year institutions with fewer than 5,000 students and libraries of less than 250,000 volumes. U.S. Department of Health, Education, and Welfare, National Center for Education Statistics, Library Statistics of Colleges and Universities, Fall 1971, Analytic Report (Part C), U.S. Government Printing Office, 1973, p. 38.

[4]Kenneth A. Collins, "Data Management Systems, Part I, A Model Approach to Automating Small Library Files," Special Libraries, March 1975, p. 125.

[5]UNIVAC 1100 series BASIC (UBASIC).

[6]Anglo-American Cataloging Rules published by the American Library Association.

[7]The programs are not, at present, capable of producing output on 3 x 5 cards.

[8]It will be noted, for example, in the sample print-outs in Appendix A that words are split at the end of a line without reliance on the conventional rules of word division.

[9]This recently devised and tested program will be formally implemented during the 1976-77 fiscal year.

[10]Robert Balay and Christine Andrew, "Use of the Reference Service in a Large Academic Library," College & Research Libraries, January 1975, pp. 9-26.

[11]Kenneth A. Collins and William W. West, "Data Management Systems, Part II, Journal Routing - An Example of Library Applications," Special Libraries, April 1975, pp. 205-211. The purchase price for such systems begins at about $100,000.00. It may also be noted that the example given by Collins is somewhat trivial in nature - the preparation of periodical routing slips.

[12]Ohio College Library Center. For a listing of the types of projects engaged in see F.G. Kilgour, "Projects of the Ohio College Library Center," Illinois Libraries, May 1973, pp. 337-339.

APPENDIX A

The samples are from a print-out of a sort by composer within subject from the choral performance score library catalog. They are of a segment from the voicing subject headings - in this case for four-part mixed voices without accompaniment - and the subject heading for the Biblical source of the text - Psalm 150 is represented.

MIXED 4
KARVONEN, PAUL, TEMPLE OF HOLINESS, THE, H.W. GRAY, 1970, 0213
SATB
MIXED 4
KASTALSKY, A., LORD IS GREAT, THE, CHORAL ART PUB., 1946, 0214
SATB
MIXED 4
KIRK, THERON, FOUR WILLIAM BLAKE SONGS, KJOS, 1974, 0532
SATB
MIXED 4
KITSON, C.H., JESU, GRANT ME THIS I PRAY, OXFORD, 1933, 0216
SATB
SATB, ORGAN
PSALM 150
LAMB, GORDON H., ALEATORY PSALM, WORLD LIBRARY PUB., 1973, 0524
SATB, T SOLO
PSALM 150
LOCKWOOD, NORMAND, CLOSING DOXOLOGY, THE, BROUDE BROTHERS, 1952, 0150
SSAATTBB, BAND
PSALM 150
PARKER, ALICE, PSALMS OF PRAISE, LAWSON-GOULD, 1968, 0287
TB, PERCUSSION

APPENDIX B

Below is a sample of the dialog for entry of data using the program BIBLIO-LIB.

```
WHICH SUBJECT BIBLIOGRAPHY DO YOU WISH TO WORK WITH?
?  CHORAL MUSIC
TYPE 1 IF YOU WISH TO ADD RECORDS TO A BIBLIOGRAPHY,
     2 IF YOU WANT A PRINTOUT OF THE CURRENT SUBJECT BIBLIOGRAPHY,OR

     3 IF YOU WISH TO UPDATE A RECORD IN THE BIBLIOGRAPHY.

? 1
DO YOU WANT INSTRUCTIONS AS TO HOW TO PRESENT THE DATA? YES OR NO
?  NO
ENTER AUTHOR(S) (IF NONE, TYPE THE WORD  NONE)--AND DON'T FORGET
THE QUOTES!!!!
?  'HASSLER, HANS LEO'
ENTER BOOK TITLE OR ARTICLE TITLE (OR SEGMENT)--IN QUOTES.
?  'VERBUM CARO FACTUM EST (THUS THE WORD WAS MADE AS FLESH)'
IS THERE MORE TO THE TITLE?  NO
DO YOU WISH TO RESTART THE CURRENT RECORD?  NO

IS THIS RECORD A JOURNAL ARTICLE?  NO
ENTER IMPRINT INFORMATION:'CITY, PUBLISHER, DATE'

OR, IF THIS IS A JOURNAL ARTICLE:'VOLUME#, PAGES, DATE'
BE SURE TO PUT IN THE QUOTES AS SHOWN

?  'BROUDE, 1967'
ENTER CALL NO. (IF NONE, TYPE THE WORD  NONE)
?  '0188'

ENTER SUBJECT -- IF NONE, TYPE THE WORD  NONE.
?  'MIXED 6, INST'
ARE THERE MORE SUBJECTS?  YES
ENTER SUBJECT -- IF NONE, TYPE THE WORD  NONE.
?  'JOHN 1'
ARE THERE MORE SUBJECTS?  NO
DO YOU WISH TO RESTART THE CURRENT RECORD?  NO
IS THERE AN ABSTRACT?  YES
ENTER ABSTRACT (OR SEGMENT) --TOTAL LENGTH IS LIMITED TO
500 CHARACTERS.
?  'SSATTB, AD LIB. INSTRUMENTAL DOUBLING'
IS THERE MORE TO THE ABSTRACT?  NO
DO YOU WISH TO RESTART THE CURRENT RECORD?  NO
DO YOU WISH TO ADD MORE RECORDS?  NO
```

APPENDIX C

Sections of the report resulting from the acquisition fund accounting program are given below.

```
INPUT 1 IF YOU WISH TO UPDATE
INPUT 2 IF YOU WANT A REPORT ONLY
? 2
```

DEPT	BUDGET	ENCUMBRANCES	INVOICES	REMAINING ACTUAL FUNDS	REMAINING PROJECTED FUNDS
A/S	$1000.00	$17.50	$884.25	$115.75	$98.25
ART	$800.00	$227.22	$307.25	$492.75	$265.53
BIO	$1000.00	$429.50	$382.65	$617.35	$187.85
CHE	$1000.00	$276.57	$631.02	$368.98	$92.41
E/B	$1200.00	$512.13	$469.37	$730.63	$218.50
EDC	$1800.00	$1012.25	$489.89	$1310.11	$297.86
ENG	$5000.00	$2245.76	$1498.44	$3501.56	$1255.80
FNL	$2000.00	$1403.55	$268.72	$1731.28	$327.73
GEG	$1000.00	$123.21	$265.86	$734.14	$610.93
GEL	$1000.00	$323.50	$127.32	$872.68	$549.18
HIS	$1200.00	$478.97	$895.34	$304.66	$-174.31
MAT	$1200.00	$733.00	$4166.65	$.00	$86.55
ALF	$908.31	$.00	$908.31	$.00	$.00
TI2	$5000.00	$.00	$5000.00	$.00	$.00
TOT	$39474.96	$11170.42	$23013.60	$16461.36	$5290.94